	No.2086B	2SB1204/2SD1804
		PNP/NPN Epitaxial Planar Silicon Transistors

High-Current Switching Applications

Applications

- Relay drivers, high-speed inverters, converters, and other general high-current switching applications

Features

- Low collector-to-emitter saturation voltage
- High current and high f_T
- Excellent linearity of h_{FE}
- Fast switching time
- Small and slim package making it easy to make 2SB1204/2SD1804-applied sets smaller

() : 2SB1204

Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

			unit
Collector to Base Voltage	V_{CBO}	(-)60	V
Collector to Emitter Voltage	V_{CEO}	(-)50	V
Emitter to Base Voltage	V_{EBO}	(-)6	V
Collector Current	I_C	(-)8	A
Collector Current(Pulse)	I_{CP}	(-)12	A
Collector Dissipation	P_C	1	W
		20	W
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

$T_c = 25^\circ\text{C}$

Electrical Characteristics at $T_a = 25^\circ\text{C}$

			min	typ	max	unit
Collector Cutoff Current	I_{CBO}	$V_{CB} = (-)40\text{V}, I_E = 0$			(-)1	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = (-)4\text{V}, I_C = 0$			(-)1	μA
DC Current Gain	$h_{FE}(1)$	$V_{CE} = (-)2\text{V}, I_C = (-)0.5\text{A}$	70*		400*	
	$h_{FE}(2)$	$V_{CE} = (-)2\text{V}, I_C = (-)6\text{A}$	35			
Gain-Bandwidth Product	f_T	$V_{CE} = (-)5\text{V}, I_C = (-)1\text{A}$		180		MHz
				(130)		
Output Capacitance	C_{ob}	$V_{CB} = (-)10\text{V}, f = 1\text{MHz}$		(95)65		pF

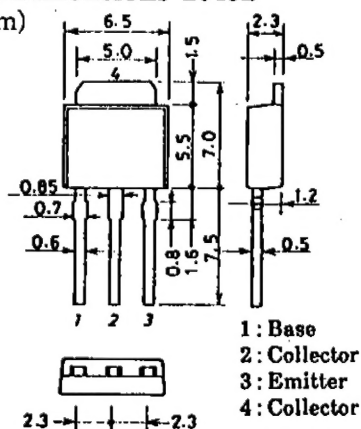
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* : The 2SB1204/2SD1804 are classified by 0.5A h_{FE} as follows :

70	Q	140	100	R	200	140	S	280	200	T	400
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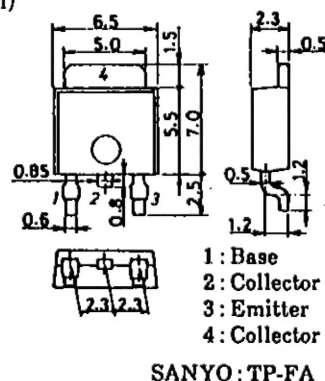
Package Dimensions 2045B

(unit : mm)



Package Dimensions 2044B

(unit : mm)

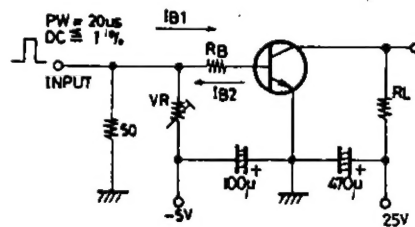


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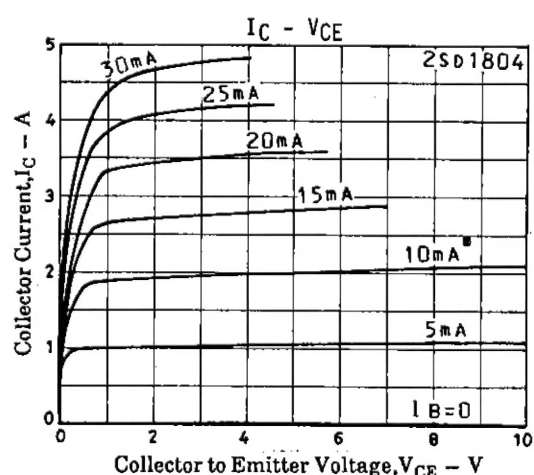
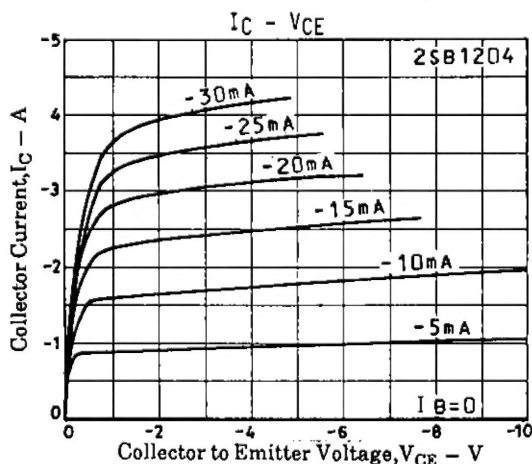
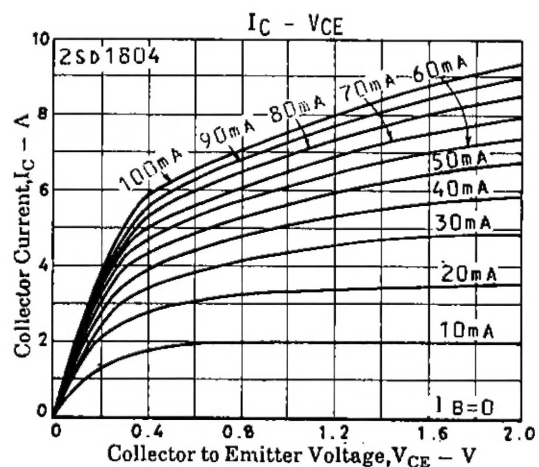
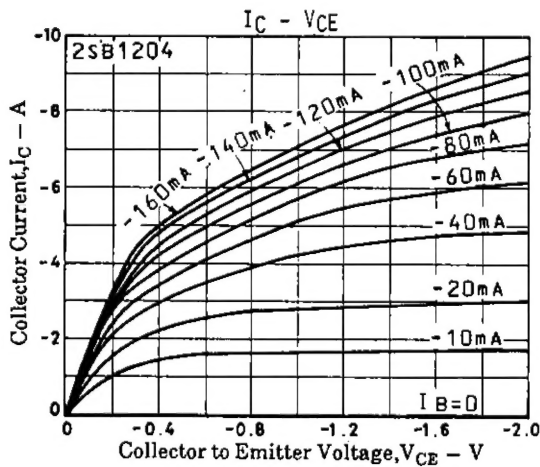
			min	typ	max	unit
C-E Saturation Voltage	$V_{CE(sat)}$	$I_C = (-)4A, I_B = (-)0.2A$		200	400	mV
				(-250)	(-500)	
B-E Saturation Voltage	$V_{BE(sat)}$	$I_C = (-)4A, I_B = (-)0.2A$			(-0.95) (-1.3)	V
C-B Breakdown Voltage	$V_{(BR)CBO}$	$I_C = (-)10\mu A, I_E = 0$	(-60)			V
C-E Breakdown Voltage	$V_{(BR)CEO}$	$I_C = (-)1mA, R_{BE} = \infty$	(-50)			V
E-B Breakdown Voltage	$V_{(BR)EBO}$	$I_E = (-)10\mu A, I_C = 0$	(-6)			V
Turn-on Time	t_{on}	See specified Test Circuit.		(50)		ns
Storage Time	t_{stg}	"		(450)500		ns
Fall Time	t_f	"		20		ns

Switching Time Test Circuit

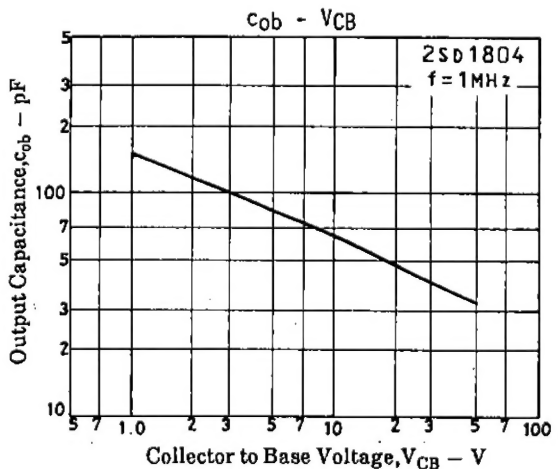
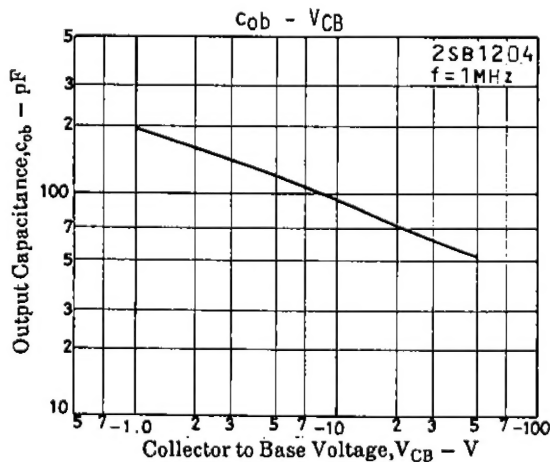
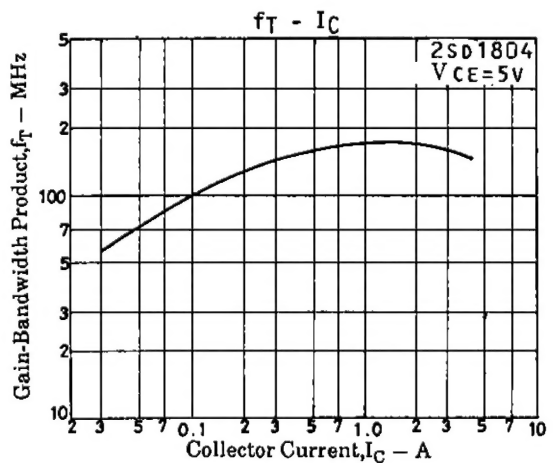
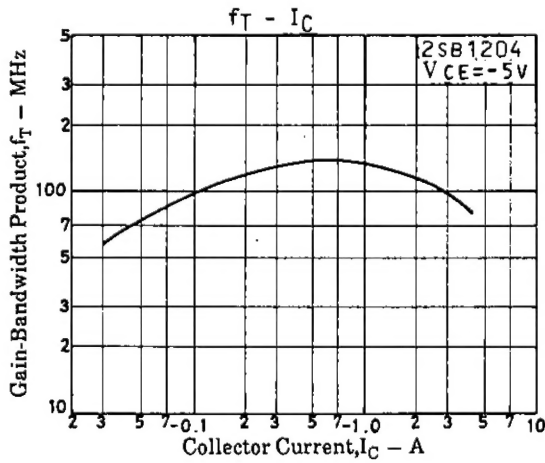
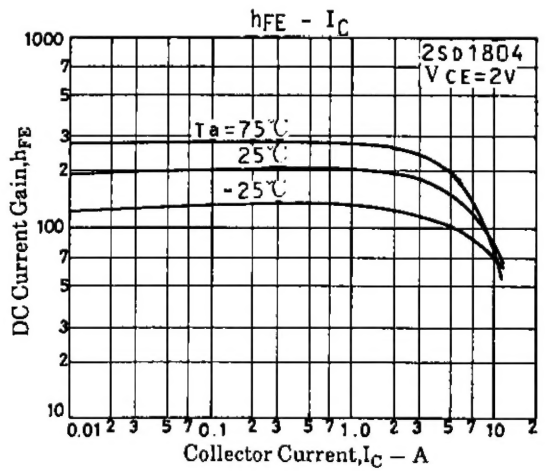
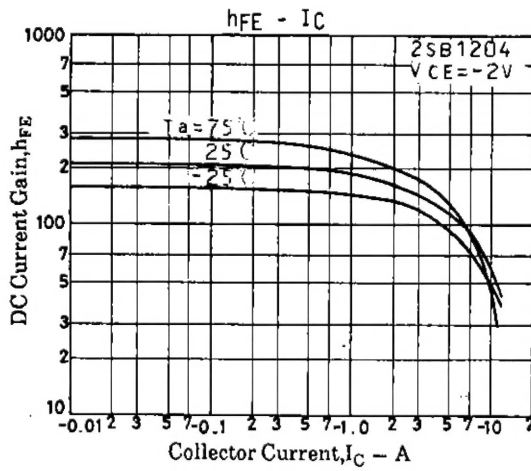
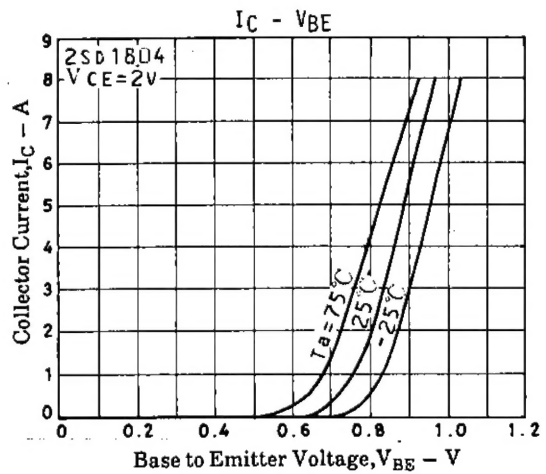
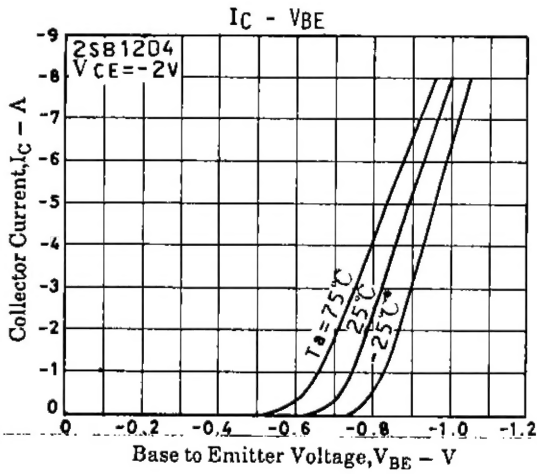


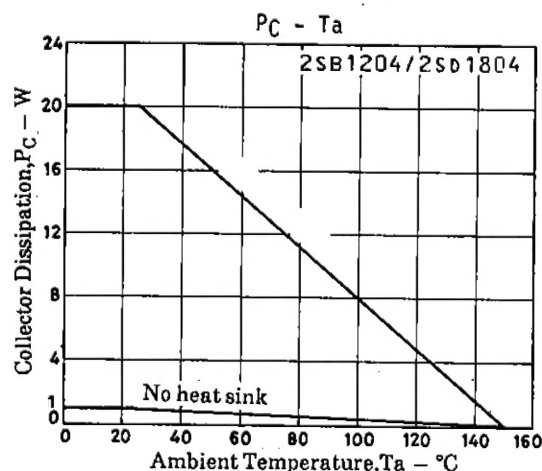
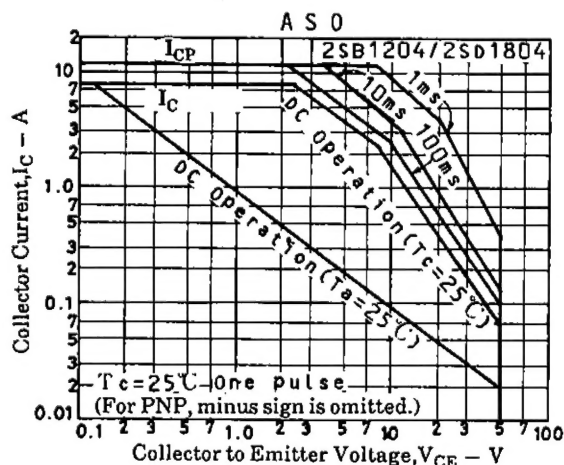
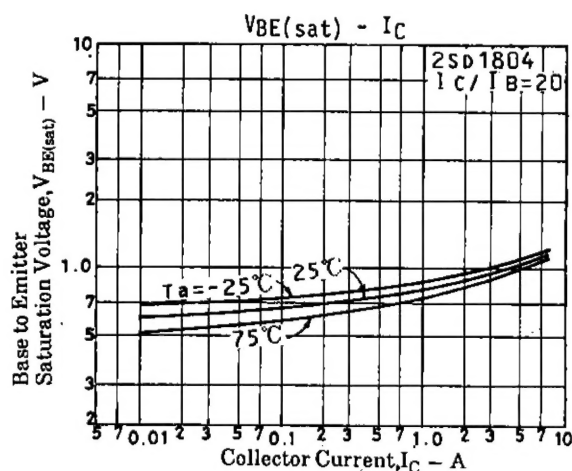
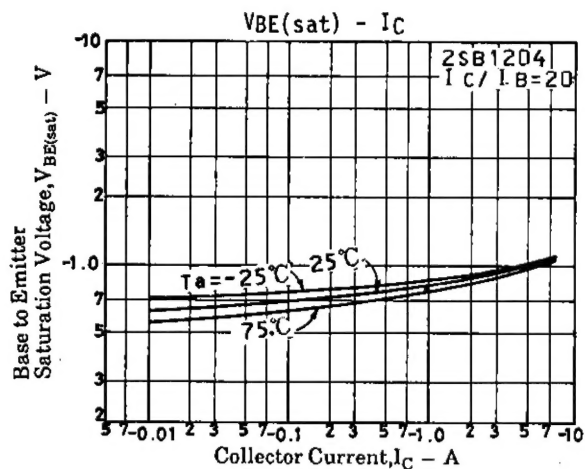
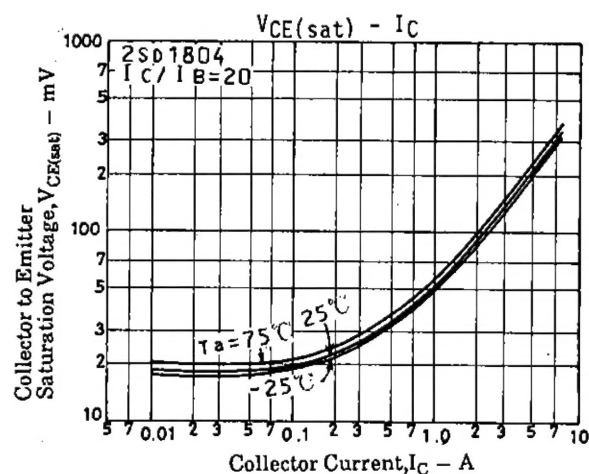
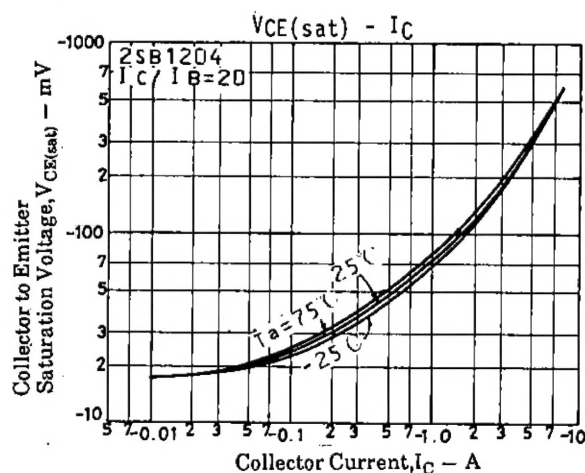
$$I_C = 10 \text{ mA}, I_{B1} = -10 \text{ mA}, I_{B2} = 4 \text{ mA}$$

(For PNP, the polarity is reversed.)

Unit (Resistance : Ω , Capacitance : F)

2SB1204/2SD1804





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